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ROGER P. WOLF et al.  
Serial No.: 10/764,742

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## REMARKS

Claims 2, 5, 13, 23, 26, 34 and 47 have been cancelled without prejudice. Claims 1, 3, 4, 6-12, 24, 25, 27-33, 35-46 and 48-53 remain before the Examiner for reconsideration. Claims 1, 3, 4, 6, 8, 15, 16, 22, 24, 25, 27-30, 33, 35-37, 43, 45, and 48-50 have been amended.

In the Office Action dated August 1, 2006, the Examiner indicated that: "Applicant's arguments with respect to claims 1-53 have been considered but are moot in view of the new ground(s) of rejection."

In that regard, the Examiner rejected Claims 1, 22 and 43-46 under 35 U.S.C. 103(a) "as being unpatentable over Jackson in view of Foster." Specifically, the Examiner asserted that:

Jackson discloses in Figures 1-5 and in the specification a device and method for teaching mathematics comprising a work surface and a plurality of movable elements, where each element comprises a visible mathematical symbol and can be selectively placed on the work surface via an attachment member on the back of the pieces. Jackson further discloses in column 3, lines 47-49 that in one embodiment the board and pieces may be magnetic, in which case the pieces are inherently slidable. Jackson fails to disclose that the movable elements have corresponding Braille indicia thereon as recited. Foster discloses in column 8, lines 39-50 a display board with pieces which have Braille markings on them. This feature is clearly intended for use by visually impaired students, thus suggesting the claimed method. It would have been obvious to one of ordinary skill in the relevant art to modify the device and method of Jackson by providing markings for visually impaired users for the purpose of allowing such users to learn using the device. With respect to claim 45, it is not clear how the boundaries of the claim are defined.

"Enlarged" is a relative term which does not distinguish the invention from the prior art. The symbols of Jackson are large enough to be read by at least some visually impaired people.

Applicants respectfully traverse the Examiner's rejection

Jackson is discussed in paragraph 6 of the present specification. Jackson discloses an educational device for teaching arithmetical operations to sighted persons. The device includes a graph- or grid-like base member having a plurality of squares or individual boxes. The device includes packets of numerals for application to the board in

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a manner set by the grid and an optional rack for holding the numerals for retrieval. The device also includes various nonnumeric cards such as remainder cards, cross-out cards, decimal point cards, arrows, subtraction/addition/multiplication bars, and a long division symbol for application to the base member. The components can be applied to the board through the use of magnets.

As admitted by the Examiner "Jackson fails to disclose that the movable elements have corresponding Braille indicia thereon as recited" in the present claims. Indeed, absolutely no provision is made for the visually impaired to use the device of Jackson. Moreover, placing the characters on the grid of the base of Jackson is likely to be too cumbersome to enable a visually impaired student to timely use the device while following the instructions of a teacher in a classroom.

Nonetheless, based upon the disclosure of Foster, the Examiner asserts that asserts that "it would have been obvious to one of ordinary skill in the relevant art to modify the device and method of Jackson by providing markings for visually impaired users for the purpose of allowing such users to learn using the device." Applicants respectfully disagree. Although, Foster discloses a multi-educational device having work pieces imprinted in numerals and a Braille equivalent, one cannot used the device of Foster to create standard mathematical expressions as is possible in the present invention by sliding various numerals and standard mathematical symbols to form such standard mathematical expressions. The work pieces of Foster are affixed to the frame of Foster and are moveable only in defined slots or rows. The work pieces of Foster are not slidably positionable to any position on a work surface as are the elements of the present invention.

Until Applicants' invention, it was not standard practice to teach the vision impaired mathematics using the standard mathematical expressions taught to sighted students. Indeed, it is very difficult to formulate such expression using available Braille writing/typing tools and other tools for the visually impaired. The standard mathematical constructs, representations or expression used to teach sighted students have been developed over generations to provide an intuitive and common "mathematical

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syntax" for the instruction of mathematics. However, this intuitive and common mathematical syntax has been unavailable to the blind. Applicants have discovered that use of the common mathematical syntax of standard mathematical expressions in the instruction of visually impaired students substantially improves the learning of mathematical skills. Moreover, the devices and methods of the present invention enable visually impaired students to learn in the same classroom as students without visual impairment. Until Applicants' invention, the motivation to provide a tool by which visually impaired students could quickly formulate standard mathematical expressions was missing. Absent the hindsight provided by Applicants' invention, one skilled in the art would not combine the disclosure of Foster with that of Jackson. As the Federal Circuit stated in Orthopedic Equipment Co., Inc. v. United States, 702 F. 2d 1005, 1012, 217 USPQ 193, 199 (Fed. Cir. 1983):

It is wrong to use the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit. Monday morning quarterbacking is quite improper when resolving the question of nonobviousness in a court of law.

In any event, combination of the disclosure of Jackson with that of Foster does not result in the present invention. To enable a visually impaired student to quickly and repeatedly formulate standard mathematical expressions, the present invention provides a work surface of sufficient surface area to provide for positioning a plurality of the moveable elements around at least a portion of the perimeter of the surface bounded by the frame from which the moveable element can be slid to form a standard mathematical expression or representation. Neither Jackson nor Foster disclose such a work surface. Moreover, unlike the devices of Jackson and Foster, the work surface of the present invention is bounded by a frame defining an abutment boundary for positioning of the movable elements. The frame defines and bounds the perimeter of the work surface of the present invention for easy positioning of moveable elements (for example, in groups of like elements) in predetermined positions for each of access by a visually impaired student during formation of mathematical expressions or representations.

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The present invention provides a substantial improvement in the art by, for example, enabling a visually impaired student to participate in a classroom setting with students that are not visually impaired and to construct mathematical equations that are of substantially the same form as the mathematical equations created upon the display used for instructing students that are not visually impaired. Moreover, the learning of mathematical skills by visually impaired students is substantially improved using the devices and methods of the present invention.

The Examiner rejected claims 2-4, 12 and 23-25 under 35 U.S.C. 103(a) "as being unpatentable over Jackson in view of Foster, and further in view of Smith." Specifically, the Examiner asserted that:

Jackson as viewed with Foster discloses all of the limitations of the claims with the exception of the frame which defines an abutment. Such frames are well known in display devices, as shown for example in Figure 1 and in the specification of Smith. It would have been obvious to one of ordinary skill in the relevant art to modify the device and method of Jackson as viewed with Foster by providing an abutment-defining frame for the purpose of more clearly defining the boundaries of the display area. With respect to claims 4 and 25, it is not clear how the boundaries of the claim are defined. "Enlarged" is a relative term which does not distinguish the invention from the prior art. The symbols of Jackson are large enough to be read by at least some visually impaired people. With respect to claim 12, Official Notice is taken that Nemeth Braille is a known means of communication, as acknowledged by applicant in the specification, and would have been obvious to provide in lieu of standard Braille indicia.

For the reasons set forth above, Applicants respectfully traverse the Examiner's rejection. Smith does not overcome the deficiencies of Jackson and Foster set forth above.

Further, the present invention provides device and methods of instructing visually impaired students and is not a "display" device such as the advertising display device of Smith. In the case of, for example, a device such as the device of Jackson wherein cards are retained in a rack or kept on a table to be placed upon a surface, an abutment boundary may be a hindrance to placement of the cards or other elements on the surface.

The Examiner also rejected Claims 5-11, 13-19 and 26-40 under 35 U.S.C. 103(a)

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"as being unpatentable over Jackson in view of Foster and Smith, and further in view of Olivera." Specifically, the Examiner asserted that:

Jackson as viewed with Foster and Smith discloses all of the limitations of the claims with the exception of the features pertaining to the placement and storage of the elements. Olivera discloses in Figure 1 and in the specification a display device and method comprising elements each having a symbol, where the elements are stored in stacked fashion in compartments around the perimeter of the device when not in use, each compartment containing a plurality of elements each having a specific symbol. It would have been obvious to one of ordinary skill in the relevant art to modify the device and method of Jackson as viewed with Foster and Smith by storing like elements in stacks in compartments around the perimeter of the display area for the purpose of making it easier for a user to selectively obtain and use a desired symbol in the display.

For the reasons set forth above, Applicants respectfully traverse the Examiner's rejection. Olivera does not overcome the deficiencies of Jackson, Foster and Smith set forth above.

Olivera discloses the positioning of demonstrating members C in individual wells or chambers formed around the outside of a demonstrating board B. Olivera does not disclose or suggest a working surface having sufficient surface area to provide for positioning a plurality of the moveable elements around at least a perimeter of the work surface bounded by the frame from which the moveable element can be slid to form a standard mathematical expression or representation. Positioning of the moveable elements of the present invention in chambers or wells during use of the device of the present invention would substantially hinder a visually impaired student's access to such moveable element for quick formation of mathematical expressions or representations.

The Examiner rejected claims 20 and 21 under 35 U.S.C. 103(a) "s being unpatentable over Jackson in view of Foster, and further in view of Foresman." Specifically, the Examiner asserted that:

Jackson as viewed with Foster discloses all of the limitations of the claims with the exception of the symbols including an equals sign, as Jackson discloses each of the other recited elements. Foresman discloses in Figure 1 and in the specification a display device for creating mathematical equations comprising an equals sign. It would have been obvious to one of ordinary skill in the relevant art to modify the device and method of Jackson as viewed with Foster by

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providing an equals sign for the purpose of allowing a user to demonstrate that relationship between numbers.

For the reasons set forth above, Applicants respectfully traverse the Examiner's rejection. Foresman does not overcome the deficiencies of Jackson and Foster set forth above.

The Examiner rejected claims 41 and 42 under 35 U.S.C. 103(a) "as being unpatentable over Jackson in view of Foster, Smith and Olivera, and further in view of Foresman." Specifically, the Examiner asserted that:

Jackson as viewed with Foster, Smith and Olivera discloses all of the limitations of the claims with the exception of the symbols including an equals sign, as Jackson discloses each of the other recited elements. Foresman discloses in Figure 1 and in the specification a display device for creating mathematical equations comprising an equals sign. It would have been obvious to one of ordinary skill in the relevant art to modify the device and method of Jackson as viewed with Foster, Smith and Olivera by providing an equals sign for the purpose of allowing a user to demonstrate that relationship between numbers.

For the reasons set forth above, Applicants respectfully traverse the Examiner's rejection. Foresman does not overcome the deficiencies of Jackson, Foster, Smith and Olivera set forth above.

The Examiner rejected Claims 47-53 under 35 U.S.C. 103(a) "as being unpatentable over Jackson in view of Foster, and further in view of Olivera." Specifically, the Examiner asserted that:

Jackson as viewed with Foster discloses all of the limitations of the claims with the exception of the features pertaining to the placement and storage of the elements. Olivera discloses in Figure 1 and in the specification a display device and method comprising elements each having a symbol, where the elements are stored in stacked fashion in compartments around the perimeter of the device when not in use, each compartment containing a plurality of elements each having a specific symbol. It would have been obvious to one of ordinary skill in the relevant art to modify the device and method of Jackson as viewed with Foster by storing like elements in stacks in compartments around the perimeter of the display area for the purpose of making it easier for a user to selectively obtain and use a desired symbol in the display.

For the reasons set forth above, Applicants respectfully traverse the Examiner's rejection. Olivera does not overcome the deficiencies of Jackson, Foster and Smith set forth above.

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In view of the above amendments and remarks, the Applicants respectfully requests that the Examiner, indicate the allowability of the Claims, and arrange for an official Notice of Allowance to be issued in due course.

Respectfully submitted,  
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